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AUTHOR	Pollak, Ave
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ABSTRACT

This guide, part of a series of workplace-developed materials for retraining factory workers, provides teaching materials for a workplace course in problem-solving techniques. The course is a review of basic problem-solving techniques focused on helping participants to be comfortable solving problems on the job. Topics covered include the following: defining a problem, writing a problem statement, steps in problem solving, creative thinking, people and problems, and an action plan for problem solving. The introductory materials include a course outline, course objectives, a topical outline, and information on course length and continuing education credits. Lesson plans for three sessions are provided. The session materials include teaching notes, information sheets, exercises, and worksheets. (KC)

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Problem Solving

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PEOPLE RETRAINING for INDUSTRY EXCELLENCE

CE 070 180

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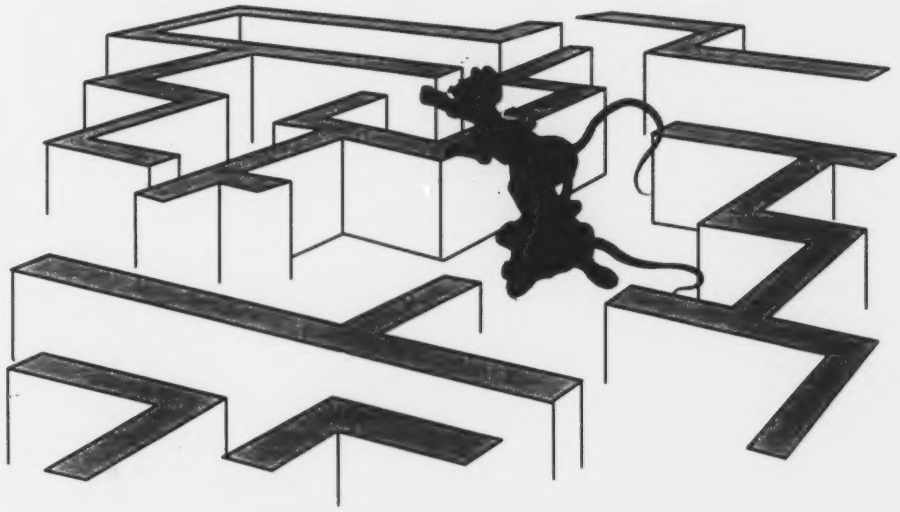
Problem Solving



Mercer County Community College
Division of Corporate and Community Programs
1200 Old Trenton Road
Trenton, NJ 08690

Elaine S. Weinberg
Director, Workplace Skills

United States Department of Education
National Workplace Literacy Program

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WORKPLACE SKILLS TRAINING PHILOSOPHY

A factory or service center creates a classroom that is very different from the one we are used to seeing in colleges and adult schools, so it only follows that our approach to teaching in the factory should also differ.

Our goal is to teach employees skills that they need in order to be functional and successful in their work environment, and encourage them to apply those skills on the job and at home. For example, we motivate students to do the following:

- work more efficiently and more safely
- make fewer mistakes
- solve problems working interactively
- take greater responsibility for their jobs
- recognize the interconnectedness of the various jobs in their workplace
- be better communicators in the workplace

Company needs are revealed through a needs assessment. At that time, we also determine the basic skills needs of the employees. We are learner centered, as the individual employee's needs are considered alongside those of the company.

Once we have determined those needs, we develop curricula that incorporate basic skills, using the workplace literature (e.g. forms, applications, codes, abbreviations, charts and tables, handbooks, regulations, procedures, policies, memos, letters) of the company. Because each company is different, the needs and literature are also different; hence, we develop new materials for every company in which we teach. By utilizing these workplace items, we help students transfer and apply their skills directly to their jobs.

We rely on the classroom techniques of problem solving, cooperative learning, and group discussion. Our overall approach is concept based, with the emphasis on application, such as in role plays, dialogues, and group work. Despite the specific course titles, we incorporate the elements of math, English, and communication skills into all of our sessions.

In terms of students evaluation, after initial testing we give a pre-test and post-test in order to determine comprehension. Students receive feedback throughout the course from the instructor, as well as from fellow students as we sincerely believe in the powerful positive reinforcement of peer critiques and cooperative exchanges.

In essence, we believe that although we make the materials for the students with which to work, it is the students who truly make the class.

COURSE OUTLINE:

Session I

1. Introductions and get acquainted activity
2. Review course outline and goals
3. Problem solving:
   a. The importance of developing the skills to solve problems
   b. Learn the key steps in the problem solving process
   c. Practice skills through problem solving tasks and role play

Session II

1. Review Session I and discuss opportunities to use skills during the previous week.
2. Recognizing the importance of good communication, critical thinking, decision making and ways to avoid procrastination in problem solving.
   a. Practice specific skills through sample problems, using the key steps.
   b. Small group work to practice building problem solving in work situations

Session III

1. Review material of previous weeks and discuss opportunities to use skills during the week
2. Practice using the 5 step process in analyzing participants own previous attempts at problem solving, both successful and unsuccessful.
3. Role play problem solving situations generated from group and discuss

PROBLEM SOLVING TECHNIQUES

OBJECTIVES:

- Describe and analyze problems encountered at work
- Write a problem statement
- Use an orderly, step by step process to solve problems
- Apply creativity to the problem solving process
- Use the brainstorming technique to help solve problems
- Become adept at using these techniques for all types of problems (work or personal)

TOPICAL OUTLINE:

- Defining a problem
- Guidelines for writing a problem statement
- Steps in problem solving
- Creative thinking
- People and problems
- Action plan for problem solving

COURSE DETAILS:

- 3 week course, 2 hours each session
- 0.6 C.E.U. (Continuing Education Unit)

PROBLEM SOLVING ♦ SESSION I

TEACHING NOTES:

- Welcome, introductions and ice breaker activity
- Discuss outline and individual course goals/interests
- Discuss hand-out "When is there a problem?"...Involve participants by asking for examples from their own experiences
- Problem solving activities: "9 Dots", "10 Pennies" (individually first, then groups)

  ⇒ Discuss the problem solving that occurred individually and in small groups – Highlight differences/similarities/team work

  ⇒ Highlight creativity as part of the process

  ⇒ Note feelings elicited; approaches taken – Draw out discussion of emotions related to on-the-job problems

- Discuss hand out "5 Key Steps..." Focus in depth on steps 1 & 2
- Draw in examples from activities as done above, relate to job related problems
- Discuss hand out " Solving Problems"
- Case study hand out for discussion/role-play in steps 1 and 2 of the 5 step process: Discuss in small groups, then full class – Draw out differences in viewing and defining a problem, referring to flip charts to tie in "Key Steps".
- Case study hand out for discussion/role-play. Individual practice and then small group practice of steps 1 and 2. Discuss and highlight emotions, critical thinking, decision making, perceptions vs. facts.

PROBLEM SOLVING ♦ SESSION I

TEACHING NOTES (con't) :

- Summary of principles applied and applications for use – Role-plays will have generated many examples of specific job related problems. Use these to further the discussion.

IMPROVING PROBLEM SOLVING SKILLS

The ability to learn (that is, to acquire new information, different insights and perspectives, and basic skills) is fundamental to every employee inside a healthy company.

Skills needed:

- ability to analyze problems
- use common sense
- recognize patterns – (Have you or others seen this before?)
- learn from experience
- test guesses

➢*When is there a problem?*

When there is a difference between the way things are and the way someone would like them to be, when something goes wrong or when you want to accomplish something new, then there is a problem.

➢*What do you have to do?*

You must get the situation back to working order or accomplish your goal. In order to solve a problem you start with things as they are and work towards making it come out the way you want it to be. Problem solving can involve either correcting something that has gone wrong or accomplishing something new.

➢*What feelings do you have when you have a problem?*

Think about your own feeling/reactions to the problem situation. If you understand where you are coming from, you can consider your feelings as a factor in your problem solving process. (e.g. Are your feelings clouding your thinking or otherwise getting in your way?)

SOLVING PROBLEMS

TO SOLVE A PROBLEM, WE MUST BE WILLING TO **ADMIT THAT A PROBLEM EXISTS** AND WE MUST BE WILLING TO **COMMIT** OURSELVES **TO TRYING TO SOLVE** THE PROBLEM. (Saying that "It's not my problem" may be a contributing factor to the problem continuing!)

Very often when we are faced with difficult problems, we simply do not know where to begin in trying to solve them. Frustrated by not knowing where to take the first step we often give up trying to understand the problem. Instead we may:

1. *Act impulsively*, without thought or consideration. (e.g. "That's it! I'm walking out of here!)

2. *Do what someone else suggests* without seriously evaluating the suggestion. (e.g. "If I were you I'd ....."; or, "What should I do?")

3. *Do nothing* as we wait for events to make the decision for us. (e.g. "I'll just wait and see what happens before doing anything")

5 KEY STEPS TO PROBLEM SOLVING

1. What is the problem?

   What do I know about the situation? **Write it out!**
   What are the results I am aiming for in this situation?
   How can I define the problem/How can I state the problem clearly?
   [*if the problem is too big, break it down into smaller problems that need solving*]

2. What are the alternatives?

   What are the boundaries of the problem?
   What alternatives are possible within these boundaries?

3. What are the advantages and/or disadvantages of each alternative?

   What are the advantages of each alternative?
   What are the disadvantages of each alternative?
   What additional information do I need to evaluate each alternative?

4. What is the solution?

   Which alternative(s) will I pursue?
   What steps can I take to act on the alternative(s) chosen?

5. How well is my solution working?

   What is my evaluation?
   What adjustments are necessary?

PROBLEM SOLVING TECHNIQUES

What is...? **When...?** **How many...?** **What if...?** **Why...?**
Asking questions is essential in problem solving. That's how we use our thinking skills.

Take time to think!
Don't just jump to the quickest answer.

Working with your small group, think of a problem on the job. Brainstorm "How" and "Why" questions that will help you see the parts of the problem.

PROBLEM SOLVING

Here is a problem that might occur at work. Read the situation below for small group discussion.

> Luis didn't like the way his department scheduled vacations. He always got his last choice because he had worked there the least amount of time – five years. He figured that five years was a long time, even if he hadn't worked there as long as everyone else. He complained loudly to other workers, especially when his boss was in hearing range.

In your small group discuss:

1. *How could Luis have handled the situation better?*
   What is the problem?
   Who is involved?
   How could he have handled it – what are some alternatives?
   Which alternative might be best for him?

2. *Do you think Luis should have discussed the problem with his boss? Why or why not?*

3. *What do you think of complaining as a way to solve a problem?*

PROBLEM SOLVING TECHNIQUES

"This problem comes up over and over again. Why don't they do something about it?"

Have you heard this before? Perhaps you've said it yourself!
Quite often the same problem crops up over and over. Sometimes it is disguised a bit. But if you don't learn from your first solution, you'll just keep getting the problem again. And again!!!

Think of an example from work. Jot a few notes here about the problem:

PROBLEM SOLVING TECHNIQUES

Another approach to problem solving is to find a problem like the one you've already got. Look for a pattern. Perhaps you already came up with a solution for the other problem and with a few changes it might work with this problem.

Ask other people at work or in your personal life if they have come across a similar problem. ASKING QUESTIONS is an important problem solving tool and may be a time saver in the end. Others may offer a different perspective that helps you to see a broader picture of the problem. With a better understanding of the problem, you'll be better able to arrive at a good solution.

SMALL GROUP LEARNING TASK:

Earlier in this session you identified some work related problems. Pick one to discuss in your small group. After you have described the problem as you see it, ask the others if they have experienced something similar. Find out if they came to a satisfactory solution. Find out if there is anything they would change or do differently.

CASE STUDY I

Imagine yourself in the following situation. What would your next move be?

Discuss in small group:

1. What is the problem? Come up with a consensus definition.
2. What are the alternatives?

The labels are coming out crooked on the paint tubes. Lisa has already had her supervisor over here twice this morning to get things straightened out. Henry has also had this happen but is waiting to see if the quality control inspector red flags it. Lisa wants the supervisor to get Henry to be more careful about the quality of his work.

CASE STUDY I

Imagine yourself in the following situation. What would your next move be?

Discuss in small group:

1. What is the problem? Come up with a consensus definition.

2. What are the alternatives?

The Marketing Dept. has issued their plan on that new formulation that will slightly alter our product. Unfortunately, it is not the most conducive plan as far as you are concerned. You just spoke with some of the other managers and feelings of frustration, anger, and resignation are surfacing among you.

CASE STUDY I

Imagine yourself in the following situation. What would your next move be?

Discuss in small group:

1. What is the problem? Come up with a consensus definition.

2. What are the alternatives?

The materials for collating are stacked but you notice that the piles are very uneven. It seems to you that there is something wrong with the count so you have called your lead person over. [Henry has just come over to you suggesting that you all get on with the work and <u>if</u> there is a problem, let the supervisor deal with it <u>then</u>.]

PROBLEM SOLVING ♦ SESSION II

TEACHING NOTES:

- Review Session I material for questions, discussion, self-initiated practice

- Warm-up for problem solving skills with "Hidden Squares" activity. Process through discussion – focusing on shortsightedness from responding hastily; tie in to solving problems on the job and review 5 Key Steps – refer to flip charts.

- Discuss hand out "Problem Solving Hints"

- In depth examination of remaining steps of "5 Key Steps to Problem Solving" using case study for role-play/practice. Write list of alternatives generated on board or flip chart. Allow plenty of time for discussion as many job specific examples will be brought up.

- Discuss additional key factors to successful problem solving: "Win-Win" outcomes, effective communication, critical thinking, and decision making using appropriate hand outs for hands-on learning

- Summary of principles applied and applications for use – i.e. Consider examples provided by participants during this session and tie in.

WIN-WIN SITUATIONS

When trying to solve a problem, one person doesn't have to be completely right and the other person completely wrong. There can be two winners. Is there a solution that will result in both sides being happy? That is called a "*win-win*" situation.

How do you get there?

- Think about what each person needs.
- Discuss what the real issue or problem is.

Consider this problem situation:

Two workers, Michael and Elizabeth were arguing over the use of the big copy machine. They were both feeling a lot of stress because they had deadlines to meet.

"I've got to use it now to get this job done by the end of the day," Michael insisted.

"Well, my work is important, too, and I need to get this 100-page report ready for my boss to hand out at a 9:00 meeting tomorrow," Elizabeth argued back.

PART I

What is the problem?

_____

_____

_____

_____

WIN-WIN SITUATIONS

PART II

Brainstorm (*think up as many ideas as possible, no matter how wild*) possible solutions to Michael and Elizabeth's problem.

_____

_____

_____

_____

After brainstorming:

- Decide and discuss which solution(s) best meet everyone's needs.
- Decide how to put the plan into effect.
- Who will do what?

PROBLEM SOLVING AND THINKING/REASONING SKILLS WORKSHEET

ROLE PLAY SCENARIOS:

Situation 1. Justina is the only one here at the moment who knows how to solve this problem. But she and Bill don't get along and Bill will not ask her for help. Supervisor: "Bill, your personal problems with Justina are not my concern. We have a job to do."

Situation 2. "This paint looks different from the batch I was using before break. Do you think I should say something or just let quality control check it out?"

Situation 3. The inventory list shows that the materials for this job are in but no one seems to be able to find them.

Situation 4. "Maria, stop your department! Don't you know they (the supervisors/management) changed the production priority and we have to get this done instead?"

1. *What has happened?*_____

_____

2. *Why did this happen?*_____

_____

3. *What should have happened?*_____

_____

4. *What needs to be done to correct it?*_____

_____

PROBLEM SOLVING AND THINKING/REASONING SKILLS WORKSHEET

ROLE PLAY SCENARIOS:

Situation 1. You just heard from Dennis that we can't ask the employees to work with this compound until all the safety specs are in writing and posted. You need this order to GET DONE!!! This is a major account we are dealing with and they shouldn't be stalled anymore.

Situation 2. This is the second time this week that errors in data entry have caused production problems. The errors are a result of poor communication between your function, planning and operations. You are about to go "chew out" one of your co-workers.

Situation 3. Justina is the only one here at the moment who knows how to solve this problem. But she and Bill don't get along and Bill will not ask her for help. Supervisor: "Bill, your personal problems with Justina are not my concern. We have a job to do."

*1. What has happened?*_____

_____

*2. Why did this happen?*_____

_____

*3. What should have happened?*_____

_____

*4. What needs to be done to correct it?*_____

_____

PROBLEM SOLVING TECHNIQUES

ROLE PLAY SCENARIOS:

Suppose your supervisor or co-worker brought to your attention any of the following problems. How would you respond?

Situation 1. Anita is the only one here at the moment who knows how to solve this problem. But she and Bill don't get along and Bill will not ask her for help. Supervisor: "Bill , your personal problems with Anita are not my concern. We have a job to do."

Situation 2. The customer's materials are ready for shipping. Estelle has put a large rubber band around each group of envelopes to make it easier to carry to the shipping department, and has left them there. Unfortunately, Mike (Shipping) thought that each packet was going to the same location instead of individual mailings.

Situation 3. The inventory list shows that the materials for this job are in but no one seems to be able to find them.

Situation 4. "Elaine, stop your department! Don't you know they (the supervisors/management) changed the production priority and we have to get this done instead? This is a rush job and we need all the help we can get."

PROBLEM SOLVING ♦ SESSION III

TEACHING NOTES:

- Review Session II material for questions, discussion, self-initiated practice
- Warm-up for problem solving skills with "The IX Exercise" – Focus on perceptions/simplicity in finding a solution
- Discuss hand out summarizing problem solving and "What's Right Here?"
- Discuss hand out "People and Problems" – personality differences will come out in discussion and consequently different approaches to problem admission/ recognition/ solving
- Discuss and role-play case study, completing the 5 step process
- Generate and discuss individual job related problems identified and problem solve in small groups
- Using worksheets, review/analyze unsuccessful/successful problem solving
- experience
- Summary of principles applied
- Course evaluation and wrap up

PEOPLE AND PROBLEMS

Almost all problems, even mechanical failures, involve people one way or another.

Sometimes people are the problem. The causes of people's behavior are not always obvious. It would be nice if the people responsible would evaluate and account for their own behavior. But that doesn't always happen.

As Eldridge Cleaver said "If you're not part of the solution, you're part of the problem".

A key to success for people and problems? Invite people to participate in the problem solving process.

PROBLEM SOLVING TECHNIQUES

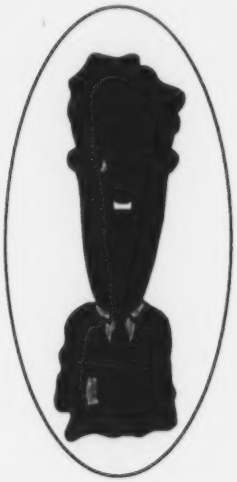
COMMUNICATIONS WITH OTHERS:

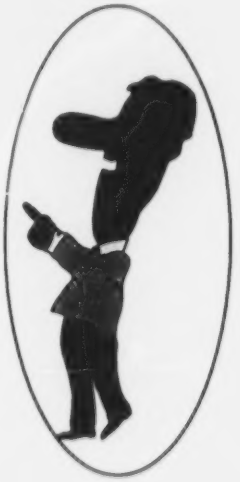
Verbal

Choice of words (accusing?; objective?)
Tone of voice
Volume of voice

Non-verbal

Eye contact
Personal space
Body posture





Are any of your co-workers from another culture or country?

Do you notice if some of the accepted communication practices here are very different, perhaps even difficult for them?

Are there different behaviors expected from men vs. women?

Discuss in your small group how these issues may impact the problem solving communication.

PROBLEM SOLVING TECHNIQUES

COMMUNICATING WITH OTHERS ABOUT PROBLEMS:

1. The **AGGRESSIVE** approach
   - blaming/attacking
   - intimidating – in body language and tone of voice
   - wants to get own way
   - effect on others: resentment, fear; barriers go up

2. The **JUDGMENTAL** approach
   - expresses your honest opinion but...
   - people resent being told what they should/shouldn't do; what is right/ wrong
   - critical without considering this a communication pitfall
   - effect on others: leads to arguments

3. The **SARCASTIC** approach
   - implies contempt; edge in voice, eyes convey dissatisfaction
   - others are not sure if humor is intended; may not want to seem overly sensitive
   - usually there is some underlying anger
   - effect on others: creates tension, suspicion and people feel hurt

4. The **PLEADING / NON-ASSERTIVE** approach
   - tries to avoid conflict
   - person seems weak; eyes often downcast or otherwise avoiding; shoulders
   - slumped
   - often lack self confidence and have low self esteem
   - effect on others: message loses impact

5. The **ASSERTIVE** approach
   - honest and direct manner without blame or being offensive
   - eye contact; confidence shows in body posture and tone of voice
   - stands up for self and confronts others when necessary in a respectful way
   - effect on others: creates constructive atmosphere of mutual respect, frankness

PROBLEM SOLVING TECHNIQUES

SEPARATING OPINION FROM FACT:

- *Definition: Opinion – a belief stronger than impression and less strong than positive knowledge. Fact – the quality of being actual; something that exists or occurs.*

Think of a work situation that has caused a problem.

- What is the problem?
  Review your thoughts. Do you need to separate opinion from fact?

- Whose problem is it?
  Review your thoughts. Are you blurring opinion with fact?

- What feelings are stirred up by this?
  Are your feelings clouding your rational mind and objectivity?

Once you are clear about the information above, you can move through the remaining steps of the "5 Key Steps" formula.

PROBLEM SOLVING WORKSHEET

When it's been a successful experience:

1. Describe a situation in which you successfully solved a problem. [What did you think was happening?]

2. What reactions/thoughts did you have about the situation? What did you do to solve it? [Look at the hand-out for the "5 Key Steps to Problem Solving" and see whether your efforts followed these steps.]

3. Did you handle (problem solve) this alone or did you work together with others to solve this problem? What was it like? How did it all work out?

4. As you look back on the situation what do you think you might have done differently as far as following the "5 Key Steps" format?

PROBLEM SOLVING WORKSHEET

When it's been an unsuccessful experience:

1. Describe a situation in which you did not cope well with a problem.

2. What thoughts, feelings and behaviors prevented you from dealing with this situation effectively?

3. As a result of this experience, what did you learn about your problem solving? [What would (or did) you do differently the next time especially as you consider the "5 Key Steps to Problem Solving"?]

Review your responses on the two worksheets. What are the **differences** in how you perceived and handled the two situations?